KOVAL', Ye.T.; SHCHEGOLEV, V.N.

Analysis of the performance of a revolving multicell diffuser,
Sakh. prom. 33 no.5:29-34 My '59.   (MIRA 12:7)

1.TSentral'nyy nauchno-issledovatel'skiy institut sakharnoy promysh-
lennosti.
        (Sugar machinery)   (Diffusers)

KOVAL', Ye.T.; ZAGORUI'KO, A.Ya.; LIPETS, A.A.

Studying the filtration of the extraction liquor in a cossette bed as applicable to rotary diffusers. Trudy TSINS no.7:103-123 '60. (MIRA 16:2)

1. Laboratoriya sotodobyvaniya TSentral'nogo nauchno-issledovatel'skogo instituta sakharnoy promyshlennosti.
        (Sugar manufacture)   (Sugar machinery)

KOVAL', Ye.T.; ZAGORUL'KO, A.Ya.; LIFETS, A.A.

Effect of the velocity rate of the extraction liquor on the
coefficient of diffusion of sugar from the beet tissue. Trudy
TSINS no.7:133-138 '60.   (MIRA 16:2)

1. Laboratoriya sokodobyvaniya TSentral'nogo nauchno-issledo-
vatel'skogo instituta sakharnoy promyshlennosti.
                    (Sugar manufacture)

KOVAL', Ye.T.; ZAGORUL'KO, A.Ya.

Problems of the theory and design of a continuous diffuser.
Trudy TSINS no. 7:139-170 '60.   (MIRA 16:2)

1. Laboratoriya sokodobyvaniya TSentral'nogo nauchno-
issledovatel'skogo instituta sakharnoy promyshlennosti.
          (Sugar industry--Equipment and supplies)

KOVAL', Ye.T.; ZAGORUL'KO, A.Ya.; LIFETS, A.A.

New method of comparison assaying of the various systems of
diffusers. Trudy TSINS no.7:171-175 '60.   (MIRA 16:2)

1. Laboratoriya sokodobyvaniya TSentral'nogo nauchno-issledovatel'-
skogo instituta sakharnoy promyshlennosti.
                (Sugar Industry—Equipment and supplies)

KOVAL', Ye.T.; ZAGORUL'KO, A.Ya.

Theoretical principles of extracting sugar from sugar beets by
diffusion. Sakh.prom. 35 no.7:15-20 Jl '61.   (MIRA 14:7)

1. TSentral'nyy nauchno-issledovatel'skiy institut sakharnoy
promyshlennosti.
          (Sugar manufacture)   (Sugar beets)

ZOTOV, V.P.; MAKHINYA, M.M.; PARSHIKOV, M.Ya.; GAVRILOV, A.N.; SILIN, P.M.;
    GOLOVIN, P.V.; KHEYZE, N.V.; BUZANOV, I.F.; KHELEMSKIY, M.Z.;
    YAPASKURT, V.V.; SHARKO, A.P.; SANOV, N.M.; LITVAK, I.M.; IVANOV,
    S.Z.; LEPESHKIN, I.F.; KLEYMAN, B.M.; YEPISHIN, A.S.; GOLUB, S.I.;
    GERASIMOV, S.I.; GEUBE, V.R.; PASHKOVSKIY, F.M.; LITVINOV, Ye.V.;
    BENIN, G.S.; IVANOV, P.Ya.; VINOGRADOV, N.V.; PONOMARENKO, A.P.:
    ZHIDKOV, A.A.; KOVAL', Ye.T.; KARTASHOV, A.K.; NOVIKOV, V.A.

    Sixtieth birthday of A.N.Shakin, Director of the Central
    Scientific Research Institute of the Sugar Industry. Sakh.
    prom. 35 no.7:33 Jl '61.   (MIRA 14:7)
        (Shakin, Anatolii Nikitovich, 1901-)
                                (Sugar industry)

KOVAL', Ye.Z.; KURMELEVA, N.F. [Kurmel'ova, N.F.]; LAVITSKAYA, Z.G.
[Lavits'ka, Z.H.]

      Materials on the fungous flora of trees ans shrubs in the city
      parks of the southern Ukraine. Visnyk Kyiv.un. no.1. Ser.biol.
      no.2:5-11 '58.   (MIRA 16:4)
                   (UKRAINE--FUNGI, PHYTOPATHOGENIC)
           (UKRAINE--WOODY PLANTS--DISEASES AND PESTS)

KOVAL', Yu. (UB5ES)

Sports section of the radio club. Radio no.6:9 Je '64.
(MIRA 17:10)

1. Predsedatel' korotkovolnovoy i ul'trakorotkovolnovoy sektsii
Dneprodzerzhinskogo samodeyatel'nogo sportivnogo radiokluba
Vsesoyuznogo dobrovol'nogo obshchestva sodeystviya armii,
aviatsii i flotu.

LEGKIY, V.M., kand.tekhn.nauk; KOVAL', Yu.D., inzh.

Calculation of the heat absorption of rotary regenerative air preheaters with slotted packing. Izv. vys. ucheb. zav.; energ. 6 no.10:68-77 O '63.   (MIRA 16:12)

1. Kiyevskiy ordena Lenina politekhnicheskiy institut. Predstavlena kafedroy kotel'nykh ustanovok.

GENDELEVA, M.A., podpolkovnik med.sluzhby; KOVAL', Yu.F., kapitan med.sluzhby

Clinical aspects and course of acute pneumonia. Voen.-med.zhur.
no.12:26-29 D '58.   (MIRA 12:12)
          (PNEUMONIA,
               clin. aspects & course (Rus))

KOVAL', Yu.F., kapitan med.tsinskoy sluzhby

Ascorbic acid metabolism in patients with chronic stomach diseases.
Voen.-med.zhur. no.9:82 S '61.   (MIRA:10)
          (ASCORBIC ACID)   (STOMACH--DISEASES)

KOVAL', Yu.F.; YEVLANOVA, L.I.

Accelerated excretion of radioiodine from the organism. Med.
rad. 10 no.2:41-44 F '65.   (MIRA 18:6)

1. Kafedra voyenno-polevoy terapii (nachal'nik - prof. Ye.B.
Zakrzhevskiy) Voyenno-meditsinskoy ordena Lenina akademii
imeni Kirova, Leningrad.

L 9 0 0 6   EWT(m)/EWP(q)/EWP(t)   Pad   ASD(m)-3   ID/HW
ACCESSION NR: AT6042835   S/2601/64/000/018/0069/0073

AUTHOR: Kovil', Yu. N.; Khandros, L. G.

TITLE: Effect of plastic deformation of gamma phase on strengthening
of iron-nickel alloy during subsequent martensitic transformation

SOURCE: AN UkrSSR. In-t fiziki metallofiziki. Sbornik nauchnykh
rabot, no. 18, 1964. Voprosy fiziki metallov i metallovedeniya (Prob-
lems in the physics of metals and physical metallurgy), 69-73

TOPIC TAGS: thermomechanical treatment, nickel steel, thermomechani-
cal treatment, nickel steel, iron nickel alloy, iron nickel alloy
strengthening

ABSTRACT: The effect of various factors in thermomechanical treat-
ment on the strengthening of an Fe-Ni alloy containing 28% Ni (M$_s$
temperature of 313—318K) was investigated in an attempt to separate
the effects of deformation and martensitic transformation. The spe-
cimens, 5x5x0 mm, were held at 1273K for 7—10 min, cooled to 473K,
upset with 11, 25, 32, 44, 55, 77, and 79% reduction, cooled to

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L 9130-b
ACCESSION NR: AT4042835

293°, tested for hardness, cooled to 77K, and tested again. The first hardness test was assumed to determine the hardness increase contributed by plastic deformation, and the second, that contributed by martensitic transformation. Results (see Fig. 1 of the Enclosure) showed that the strengthening effect of deformation continuously increases and that the effect of martensitic transformation continuously decreases with increasing reduction. Further tests showed that the strengthening effect of a-phase alone becomes significant only at contents of 50-60% and above. The size of mosaic blocks of the -phase is not significantly affected by deformation. Orig. art. has figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 19Feb63   ATD PRESS: 3105   ENCL: 01

SUB CODE: MM   NO REF SOV: 007   OTHER: 000
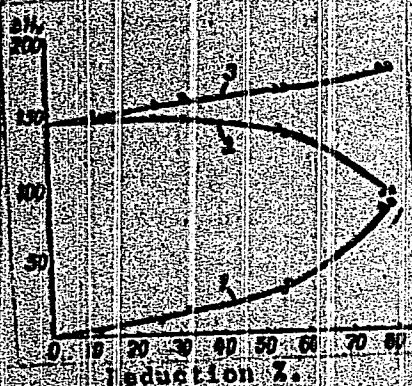
Card 2/

L 9110-65
ACCESSION NR: AT4042035

Fig. Effect of deformation on hardness increase.

1 — Hardness increase effected by plastic deformation at 77K and subsequent cooling to room temperature; 2 — hardness decrease effected by subsequent cooling to 77K; 3 — total hardness increase.

Card 1/2

lines. The results have shown that the equilibrium is not established exponentially

Card 1/2

ACC NR: AP6037024

owing to the uneven distribution of the impurity atoms. The rate of inter-impurity recombination depends strongly on the impurity concentration and increases with decreasing temperature. The time during which the excess concentration of neutral atoms of phosphorus decreases by a factor e is found to be $\tau = \tau_0 \exp(\Delta E / kT)$, where $\Delta E = 5 \times 10^{-4}$ ev and $\tau_0 = 8$ sec (T = temperature, k = Boltzmann's constant). It is noted that ΔE is of the same order of magnitude as the activation energy corresponding to the temperature dependence of the impurity conductivity of copper atoms in germanium and phosphorus and boron atoms in silicon. Consequently, measurement of ΔE over a wide temperature interval and measurement of the activation energy in the same samples would permit a more thorough study of inter-impurity recombination. Orig. art. has: 2 figures.

SUB CODE: 20/   SUBM DATE: 18Jun66/   ORIG REF: 003/   OTH REF: 006

Card 2/2

SOURCE CODE: UR/0181/66/008/008/2395/2400

AUTHOR: Vavilov, V. S.; Koval', Yu. P.; Koshelev, O. G.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Effect of illumination on the electronic spin-lattice relaxation of phosphorous and A-centers in silicon

TOPIC TAGS: spin lattice relaxation, EPR, photon, electron spin, impurity center

ABSTRACT: Two impurity centers, neutral phosphorous and negatively-charged A-centers, are investigated at 1.9°K by the EPR method. The crystals studied contained both centers ionized by light of the same spectral composition. The spin-lattice relaxation rate of both impurities was found to increase by a factor of 10 under the effect of the light, owing to electron transition into the conductivity band. Measurements were made of the rate at which equilibrium amplitudes of the spectral lines are restored as dependent on the experimental conditions after electron spin flip. The rates at which the electrons are raised to the conductivity band by the two centers are determined. The photon absorption cross section, averaged for the energies of 0.4 to 0.6 ev, is about 10 times greater for phosphorous than for A-centers. The methodology used is de-

Card 1/2

KOVAL', Yu.T., dots.

Electrosurgery and its importance in the prevention of cervical cancer.
Ped.,akush. i gin. 19 no.1:33-35 '57.   (MIRA 13:1)

1. Ginekologicheskoye otdeleniye (zav. - dots. Yu.T. Koval') Kiyev-
skogo rentgeno-radiologicheskogo i onkologicheskogo nauchno-issledo-
vatel'skogo instituta (dir. - prof. I.T. Shevchenko) i ginekologiche-
skoye otdeleniye Kiyevskogo oblastnogo onkologicheskogo dispansera
(glavnyy vrach - G.F. Didorenko).
                (ELECTROSURGERY)   (UTERUS--CANCER)

GAYEVICH, K.I. [Halevych, K.I.]; KOVAL', Yu.T., dots.

Use of cancer control measures in Kiyev Province. Ped., akush. i gin.
19 no.1:48-50 '57.
(MIRA 13:1)

1. Kiyevskiy obl:dravotdel (zav. - A.P. Movchan, glvanyy akusher-
ginekolog - K.I. Gayevich) i ginekologicheskoye otdeleniye (zav. -
dots. Yu.T. Koval') Kiyevskogo rentgeno-radiologicheskogo i onko-
logicheskogo instituta (dir. - prof. I.T. Shevchenko).
(KIYEV PROVINCE--CANCER)

KOVAL', Yu.T., dots.

Intraephithelial cancer (carcinoma in situ); its diagnosis and treatment. Ped., akush. i gin. 20 no.4:47-50 '58.   (MIRA 13:1)

1. Ginekologicheskoye otdeleniye Kiyevskogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo i onkologicheskogo instituta (direktor - prof. I.I. Shevchenko).
                    (UTERUS--CANCER)

KOVAL', Yu.T.

Treatment of preinvasional carcinoma (cancer in situ).Uch.
zap. KFROI 7:61-72'61   (MIRA 16:8)
          (UTERUS—CANCER)

HERMAN, V.M.; PONOMARENKO, Yu.F.; KOVAL', Yu.V.

Use of safety hydraulic couplings. Ugol' 33 no.9:30-33 S '58.
(MIRA 12:1)

(Coal mining machinery--Safety appliances)
(Power transmission)

SOV/122-59-4-9/28

AUTHORS: Ponomarenko, Yu.F., Candidate of Technical Sciences, and
Koval', Yu.V., Engineer

TITLE: Determination of the Axial Forces in Fluid Couplings
(Opredeleniye osevykh sil v turbomuftakh)

PERIODICAL: Vestnik Mashinostroyeniya, 1959, Nr 4, pp 38-41 (USSR)

ABSTRACT: Bearing failures in hydraulic couplings have led the
Vsesoyuznyy Nauchno-Issledovatel'skiy Ugol'nyy Institut
(VUGI) (All-Union Scientific Research Institute for Coal)
to examine the axial forces in different types of fluid
couplings. The test rig (Fig 1) consists of a shaft on
roller bearings with the driven half of the fluid
coupling keyed at one end whilst the driving half is
rigidly attached to the driving motor. The internal
bearings between the two halves are omitted. At the
other end the shaft drives the dynamometric generator,
through a coupling, permitting free axial displacement.
Collars near the shaft centre transmit the axial force
to a lever, whose opposite end presses against a ring
dynamometer. The driving d.c. motor has a swinging
frame and a controllable speed from 100 to 1500 rpm.
The dynamometer load consists of a d.c. generator with

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SOV/122-59-4-9/28
Determination of the Axial Forces in Fluid Couplings

a swinging frame and separate excitation, whose armature
is connected to the generator of a motor-generator set.
The total voltage of both generators is applied to a load
resistance. Tests were carried out at both directions
of power flow and both directions of rotation. The
tests were evaluated on the basis of the theory developed
at the Leningradskiy Politekhnicheskiy Institut
(Leningrad Polytechnical Institute) reported by A.Ya.
Kochkarev and G.I. Basalayev, (Trudy LPI Nr 177,
Leningrad 1955). The total axial force is subdivided
into a component depending on the conditions of
circulation in the flow passages and another component
equal to the supply pressure multiplied by the
uncompensated (net) surface area of the coupling. The
first component is put equal to a factor depending on the
design and operating condition multiplied by the product
of the specific gravity of the working fluid, the square
of the rpm and the fourth power of the active coupling
diameter. The tests served for the evaluation of the

Card 2/4   axial force factor for a variety of coupling designs
(Fig 2) and in several important conditions of operation.

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Determination of the Axial Forces in Fluid Couplings

Torque limiting couplings operate for any length of time solely at nominal slip and at full slip. In both cases similarity rules apply and computations with the axial force factor are valid. The simplest type of coupling (Fig 2a), a coupling with guide vanes (Fig 2b) and a coupling with an internal screen, have their torque and axial force factors plotted against the slip in Figs 3 and 4 for different percentages of filling. Torque limiting couplings with a supplementary space on the turbine wheel side (Fig 2d) have torque and axial force factors plotted in Fig 6. It is concluded that the axial forces at nominal slip (2-5%) can be neglected in bearing design. The main axial forces tend to draw the two wheels together. Separating forces are small and occur at small slips in some couplings. Substantial axial forces drawing the wheels together arise at slips exceeding 50% and particularly in opposite rotation. In this condition and the generator condition the axial force and torque factors indicate the qualities of the coupling. In torque limiting

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Determination of the Axial Forces in Fluid Couplings   SOV/122-59-4-9/28

        couplings, axial forces cannot be computed by the rules
        of similarity.   Bearings in such couplings should be
        designed for 100% slip conditions.
        There are 6 figures and 5 Soviet references.

Card 4/4

DOKUKIN, Aleksandr Viktorovich, laureat Gosudarstvennoy premii,
        zasl. deyatel' nauki i tekhniki RSFSR, prof., doktor
        tekhn. nauk; BERMAN, Valerian Mikhaylovich, kand.
        tekhn. nauk; PONOMARENKO, Yuriy Filippovich, kand.
        tekhn. nauk; KUSOV, Yevgeniy Fedorovich, kand. tekhn.
        nauk; KOVAL', Yuriy Viktorovich, inzh.; KASHTANOV,
        Leonid Nikolayevich, kand. tekhn. nauk; ABRAMOV, V.I.,
        ved. red.

[Centrifugal and displacement hydraulic transmissions
and the prospects for their use in the mining industry]
TSentrobezhnye i ob"emnye gidroperedachi i perspektivy
ikh primeneniia v gornoi promyshlennosti. [By] A.V.Dokukin
i dr. Moskva, Nedra, 1964. 369 p.   (MIRA 18:2)

CZECHOSLOVAKIA

KOVAL, Z.; [Affiliation not given].

"Seminar on Occupational Diseases at the Faculty of General Medicine, Charles University, at Prague, 27 Apr 66."

Prague, Pracovni Lekarstvi, Vol 18, No 9, Nov 66, pp 429 - 430

Abstract: The author reviews the following communications submitted during the seminar. VANECEK, I.; MALEK, D.; "Determination of the Inspired Amounts of Lead by the Analysis of Respirator Inserts." Details of the analytical method used in the determination are given. BOCEK, O.; JANDOVA, D.; "Mechanism of Adsorption of Toxic Substances by Lungs." As the authors did not supply a summary of their communication, their presentation is not reviewed. No references.

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CZECHOSLOVAKIA

KOVAL, Z.; Institute of Work Hygiene (UHP), Prague.

"Seminar of the Clinic of Occupational Diseases at the Faculty of General Medicine, Charles University, Prague, 23 March 66."

Prague, Pracovni Lekarstvi, Vol 18, No 10, Dec 66, pp 458-459

Abstract: The article gives short summaries of the papers submitted at the seminar . Altogether four papers were presented. KUZELOVA, M.; NOZICKA, Z.; HERMANNOVA, K.; Fibroelastosis of the Endocardium of the Left Chamber of the Heart Caused by Severe Poisoning by Sulfuretted Hydrogen. KUZELOVA, M.; NOZICKA, Z.; Poisoning by Sulfuretted Hydrogen Followed by Acute and Chronic Cardiological Symptoms, and Sudden Death 17 Years Later, Combined with an Anatomical Finding of Elastofibrosis of the Endocardium of the Left Heart Chamber. FINGERLAND, A.; KUZELOVA, M.; Fatal Poisoning by Dinitroglycol. FINGERLAND, A.; KOPECNY, J.; HUB, H.; Anatomical Findings in Sudden "Monday Death" in Workers Using Dinitroglycol and Nitroglycerin. No references.

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in the body of rabbits subjected to experimental lead poisoning. The amounts found in the soft parts of the body are described. A content of 1 mg in a rabbit weighing 3 kg caused some signs of poisoning; an amount of 4 mg was clearly toxic. FILIPOVA, J.; HAVRANEK, J.; LUKAS, E., discussed "Acute Poisonings by Borates." This communication is not reviewed. No references.

1/1

Koval, Zh. A.

Subject   : USSR/Chemistry

Card 1/1   Pub. 152 - 4/21

Authors   : Kuz'minykh, J. N. and Koval', Zh. A.

Title   : Mass transfer through a liquid phase on a screen plate during bubbling

Periodical : Zhur. prikl. khim., 28, no.1, 21-29, 1955

Abstract   : At gas velocities of 0.1 m/sec., the liquid is covered with a slight amount of foam; at gas velocities of 0.4 m/sec., the liquid consists of foam only, and at gas velocities exceeding 1 m/sec., the foam is replaced by gas streams. The mass transfer coefficient to the liquid phase reaches a maximum at 0.7-0.8 m/sec. At gas velocities exceeding 4 m/sec., the mass transfer coefficient remains constant. Nine diagrams, 8 references (4 Russian: 1934-54)

Institution: Moscow "Order of Lenin" Institute of Chemical Technology (im. D. J. Mendeleyev)

Submitted : N 16, 1953

AUTHORS: Torocheshnikov, N. S., Koval', Zh. A.

TITLE: The Experimental Investigation of the Turbulent Flow Effect in Tubes of Small Diameter (Eksperimentalnoye issledovaniye vikhrevogo effekta v trubkakh malogo diametra)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 3, pp. 603-606 (USSR)

ABSTRACT: The authors carried out an investigation to determine the effect of the turbulent flow on some construction factors of tubes of small diameter. By means of the experimental results obtained the graphical representation of the cold current or the change of the cooling effect was determined. The following construction factors were taken into account:
             1) The diameter of the end of the tube (1,2, 1,3, 1,5, 1,9, 2 mm) with a diameter of the diaphragm of 2,2 mm;
             2) The diameter of the opening of the diaphragm (1, 1,5, 1,8, 2,2, 2,5, 3, 3,8 mm) at a diameter of the tube end of 1,5 mm;
             3) The length of the hottest part of the tube (44,84, 144, 300 mm).

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SOV/156-58-3-52/52

The Experimental Investigation of the Turbulent Flow Effect in Tubes of
Small Diameter

The dependence of the temperature of the cool current on the
diameter of the end of the tube at P = 8 atm. excess pressure,
t_o = 23°, d = 2,2 mm, as well as the dependence of the tem-
perature of the cool current on the diameter of the dia-
phragm were determined. In tubes with a small diameter the
maximum cooling effect occurs at a ratio of d_T : d_D : d_C =

= 4 : 2 : 1, and the lowest temperature is reached at a
ratio of 4 : 1,5 : 1. In the case of a decrease of the ratio
L : D_T < 10 a decrease in the cooling effect occurs. In the
case of an increase of the air pressure (higher than 6 atm.
excess pressure) a slowing down in the increase of the cool-
ing effect occurs. The investigations carried out for the
separation of the gases by the turbulent flow effect did
not turn out to be successful. There are 4 figures and
6 references, 3 of which are Soviet.

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The Experimental Investigation of the Turbulent Flow Effect in Tubes of Small Diameter   SOV/156-58-3-52/52

ASSOCIATION: Kafedra tekhnologii svyazannogo azota i shche-
lochey Moskovskogo khimiko-tekhnologicheskogo instituta im.
D. I. Mendeleyeva
(Chair for the Technology of Nitrogen and Alkalies at the
Moscow Chemical and Technological Institute imeni D. I.
Mendeleyev)

SUBMITTED: September 25, 1957

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USCOMM-DC-60,610

18(4)
AUTHORS: Kuznetsov, D. A., Koval', Zh. A.,   SOV/163-58-4-14/47
             Malekhov, A. I.

TITLE: Influence of the Protective Fluxes Upon the Porosity of
             Castings Made of Magnesium Alloys (Vliyaniye zashchitnykh
             prisadok na poristost' otlivok iz magniyevykh splavov)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958,
             Nr 4, pp 82-86 (USSR)

ABSTRACT: A fluor flux is used in the works of the USSR in the production
             of parts made of magnesium alloys when casting them in
             sand-molds. A great drawback of these fluxes is the high
             toxicity of the gases and vapors separated when, in the
             workrooms, the metals are cast into the molds. Here various
             protective fluxes developed in the USSR are recorded.
             A comparison is made between the porosity of ingots when adding
             the various protective fluxes to the material of the mold under
             otherwise similar testing conditions. The tests were carried out
             according to the method of density measurement. The results
             were as follows: 1) Substituting the fluor flux or a flux based
             on sulfur by fluxes based on gravel or urea does not cause any
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Influence of the Protective Fluxes Upon the
Porosity of Castings Made of Magnesium Alloys   SOV/163-58-4-14/47

substantial change in the porosity of castings. 2) The character
of the porosity (density) distribution curves in castings made
of the primary alloy ML-5 does not permit to judge the extent
of reaction of the castings with their molds. 3) When
investigating samples made of secondary metal no considerable
changes in the porosity distribution were observed. There are
3 figures and 7 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva
               (Moscow Institute of Chemical Technology imeni Mendeleyev)

SUBMITTED: April 19, 1958

Card 2/2

RODIONOV, A.I.; KOVAL', Zh.A.; BOZHOV, I.S.

Testing turbogrid-type sieve plates with perforations of two
different diameters. Zhur.prikl.khim. 35 no.2:357-361 F '62.
(MIRA 15:2)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni
D.I.Mendeleyeva.

(Plate towers)

SHMUL'YAN, I.K.; KOVAL', Zh.A.; KUZNETSOV, D.A.

Dynamics of hydraulic processes taking place on the downcomerless
mesh plates. Trudy MKHTI no.47:30-34 '64.   (MIRA 18:9)

KOVAL', Zh.A.; SHMUL'YAN, I.K.; FROLOV, G.S.

Effect of the material of downcomerless plates on the hydraulic conditions of their performance. Trudy MKHTI no.40:86-90 '63.
(MIRA 18:12)

18.6100

69392

SOV/137-59-4-8005

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 93 (USSR)

AUTHORS: Koval'chenko, M.S., Nesipor, V.S., Samsonov, G.V.

TITLE: Investigation of Zirconium Boride[7]- Molybdenum[7] Alloys

PERIODICAL: Dopovidi AS UkrRSR, 1958, Nr 7, pp 740 - 742 (Ukr; Russian, Engl. résumé)

ABSTRACT: Mo - ZrB$_2$ alloys containing 0.5, 1, 2, 4, 5, 10, 20, 40, 60, 80, 90, 95, 96, 98, 99, 99.5 mol. % ZrB$_2$ were prepared by sintering in a Tamman furnace in H$_2$ atmosphere at 1,200 - 2,000°C. Metallographic, durometric, roentgenographic, visual and thermal analyses and shrinkage curves were used to plot a hypothetical Mo - ZrB$_2$ diagram. Metallographic and roentgenographic investigations proved ZrB$_2$ solubility in Mo up to 4% concentration. Alloys containing 5 to 40% ZrB$_2$ and alloys rich of ZrB$_2$ have a two-phase eutectic character. The authors assume that the reduced microhardness values of alloys approaching the composition of ZrB$_2$, as compared to microhardness of pure ZrB$_2$, prove a certain solubility of Mo in ZrB$_2$. The existence of lines of the new phase (60% Mo) was revealed

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Inst. Metalloceramics & Special Alloys
AS Ukr SSR

Investigation of Zirconium Boride - Molybdenum Alloys

69392

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on the radiograms; attempts to analyze this phase by the graphical method did not yield positive results. The Mo_2ZrB_2 formula is attributed to this phase (2,500 - 2,683 kg/mm2 microhardness). Investigations into the conditions of hot pressing of Mo - ZrB_2 alloys revealed that dense compact alloys can be obtained at 2,000 - 2,100°C under a pressure of 260 kg/cm².

R.A.   LX

Card 2/2

KOVAL'CHENKO, M.S.; NESEPOR, V.S.; SAMSONOV, G.V.

Condition for formation of lanthanum carbide. Zhur. prikl. khim.
31 no.9:1427-1429 S '58.   (MIRA 11:10)
              (Lanthanum carbide)

18(0)

SOV/21-59-1-9/26

AUTHORS: Samsonov, G.V., Koval'chenko, M.S., Verkhoglyadova, T.S.

TITLE: Diffusion of Silicon in Titanium, Tantalum, Molybdenum and Iron (Diffuziya kremniya v titan, tantal, molibden i zhelezo)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, Nr 1, 1959, pp 32-36 (USSR)

ABSTRACT: The authors tell of their study of the diffusion of silicon in the surface of metals, to form protective coatings thereon. Experiments were made on specimens of 99.98% titan, 99.98% molybdenum, ARMCO-iron and 99.6% Ta, 0.4% Nb tantal. Silicon was purified by the method described in reference $\int 8 \int$. The specimens were treated with silicon in an argon atmosphere, in a solid-phase bath consisting of 97% Si and 3% NH_4Cl. Ammonium chloride was introduced into the mixture to create $SiCl_4$, which accelerates the diffusion and educes

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SOV/21-59-1-9/26

Diffusion of Silicon in Titanium, Tantalum, Molybdenum and Iron

gaseous HC 1, which pickles the metal surface and facilitates the diffusion. The specimens were subjected to saturation at 600-1200°C, at intervals of 100° C, during a period of four hours. It was established that the relative change in weight, height $\frac{\Delta p}{p}$ of specimens depends on the absolute temperature and time of saturation, as expressed by the empiric equation $\frac{\Delta p}{p} = \sqrt{A\tau} \, e^{-\frac{B}{T}}$, wherein p is the relative change in weight, diameter or height, τ is the time of saturation, T is the absolute temperature, A and B are constants determined experimentally. The experiments showed that at low temperature, a single-layer silicon coating appeared at a high temperature. (1000-1200°C) a double-layer silicon coating appeared. The thicker the silicon layer, the harder the surface.

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Diffusion of Silicon in Titanium, Tantalum, Molybdenum and Iron

The principal formations of phases $TiSi$, $TaSi_2$, Mo_3Si_2 and $FeSi$ were determined, along with the coefficients and activation energy quantities of the diffusion of the above named metals. The results of the study are presented in a table. There are one table, one graph and 12 references, 9 of which are Soviet, 2 English and 1 German.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute of Metal-Ceramics and Special Alloys of AS UkrSSR)

PRESENTED: September 17, 1958, by V.N. Svechnikov, Member of the AS UkrSSR

Card 3/3

AUTHORS: Samsonov, G.V., Koval'chenko, M.S., and Verkhoglyadova, T.S.

TITLE: An Investigation of the Diffusion of Silicon Into Certain
             Transition Metals (Issledovaniye diffuzii kremniya v neko-
             toryye perekhodnyye metally)

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 3, pp 62-67 (USSR)

ABSTRACT: The possiblity of forming on the metal surface of solid sili-
             cide layers is of considerable interest for modern technique
             in view of their high durability against acids, molten salts,
             high heat, and their antithermal emission properties. The
             authors undertook this investigation for studying silicon
             diffusion into titanium, tantalum, molybdenum and iron by
             means of surface saturation. Specimens of these metals and
             silicon powder served as initial materials for the study.
             The saturation of specimens with silicon was conducted in a
             solid-phase pool consisting of 97% Si and 3% NH_4Cl by weight.
             The saturation with silicon was carried out at temperatures
             from 600 to 1,200°C in the atmosphere of argon. The relative
             changes in weight $\frac{\Delta P}{P}$ in dependence on temperature T and

             saturation time τ can be described by the empirical equation:

$$\frac{\Delta P}{P} = \sqrt{A\tau} \exp\left(-\frac{B}{T}\right) \quad (1)$$

Card 1/3

             where A and B are constants determined experimentally. After
             saturation the specimens were subjected to determination of
             electric resistance and spark-over voltage, to a metallographic
             investigation, and to measurements of the layer thickness and
             microhardness of the phases formed. The electric measurements
             were performed with a device described by G.B. Klark and G.V.
             Akimov /. Ref. 9_/. The measurements of layer thickness and
             microhardness were performed with a PMT-3 device, and the re-
             sults of them are shown in Table 1. The values of the spark-
             over voltage are given in Table 2 and the values of activation
             energy and of certain constants contained in the formulae for
             diffusion coefficients are given in Table 3. The temperature
             dependence of silicon diffusion coefficients for all the four
             metals is shown graphically in Figure 2.

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67290

18.6200

AUTHORS: Koval'chenko, M.S. and Samsonov, G.V. (Kiyev)   SOV/180-59-4-23/48

TITLE: Several Relationships in Sintering Powders of Refractory Compounds by Hot Pressing

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 4, pp 143-147 (USSR)

ABSTRACT: An investigation was carried out on the hot pressing of carbides of titanium and tungsten and borides of titanium, zirconium and molybdenum using powder of 5 to 8 microns. Fig 1 shows the effect of external pressure on the density of TiC with a loading time of 5 minutes and temperatures 1900 to 2600°C. With lower pressures there is a linear relationship at all temperatures. With higher pressures there is a bend in the curve after which the increase in density proceeds at a slower rate. Fig 2 shows the linear shrinkage against time for hot pressing of TiC at pressures 60 and 115 kg/cm^2 and temperatures 2100 to 2700°C. The highest degree of shrinkage occurs in the first few seconds after applying the load. Fig 3 shows the effect for ZrB$_2$ of applying 130 kg/cm^2 pressure after some time at 60 kg/cm^2. Fig 4, 5 and 6 show the effects of varying pressing time and pressure on the curves of density

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67290

SOV/180-59-4-23/48

Several Relationships in Sintering Powders of Refractory Compounds by Hot Pressing

temperature. For TiC the change in density at 1700 to 2300°C takes place at a high rate. For Mo_2B_5 there is a marked increase in density just above 1800°C. Further results of the effect of the pressing time are given in the Tables; Fig 7 shows the influence of pressing time on density and Fig 8 the effect of temperature on residual porosity for titanium boride. The results agree with the theories of Meyerson and Dawihl on shrinkage during hot pressing. In the first stage of densification, the mechanism is deformation of particles with quasi equilibrium between surface tension, strength of particles and external pressure at any temperature. The slower rate of densification takes place by volume diffusion. There are 8 figures, 2 tables and 5 references, 4 of which are Soviet and 1 German.

ASSOCIATION: Institut metallokeramiki i spetssplavov AN USSR (Institute of Cermets and Special Alloys AS UkrSSR)

SUBMITTED: March 2, 1959

Card 2/2

KOVAL'CHENKO, M.S.; SAMSONOV, G.V.

Investigating alloys of zirconium oxide with molybdenum. Vop.
por. met. i prochn. mat. no.7:18-24 '59.   (MIRA 14:2)
          (Zirconium boride)   (Molybdenum)   (Ceramic metals)

5 (2)

AUTHORS: Samsonov, G. V., Koval'chenko, M. S.,   SOV/78-4-12-16/35
                Verkhoglyadova, T. S.

TITLE: Production of Disilicides of Difficultly Fusible Metals

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 12,
                pp 2759 - 2765 (USSR)

ABSTRACT: Pure, finely powdered Ti, Zr, V, Nb, Ta, Cr, Mo, and W were
                mixed with silicon powder in stoichiometric ratio, pressed into
                small briquets and annealed in argon atmosphere at 600-1,200°
                for 0.5-32 hours. The heating took place in an apparatus de-
                picted in figure 1. The reaction products were analytically
                tested (under the supervision of T. Ya. Kosolapova) and radio-
                graphically (RKE and KROS cameras) for free and bound Si. The
                reaction time needed for the production of completely homogene-
                ous disilicides is given in table 1. There is an exponential re-
                lation between reaction temperature and reaction time (Fig 3),
                which allowed to calculate the activation energy for the diffu-
                sion of Si into the metals. The values of this energy are like-
                wise listed in table 1 and compared with the data given in ref-
                erence 6 for the activation energy during Si diffusion into
                compact metal. The fact that the activation energy of metallic

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Production of Disilicides of Difficultly Fusible Metals   SOV/78-4-12-16/35

powder is much higher is explained by the crystallization pres-
sure occurring in the formation of disilicide particles which
interrupts the contact between metallic and Si particles not yet
entered into reaction and complicates diffusion (Refs 7,8). The
effect of diffusion-inhibiting oxide films is also likely to be
more strongly pronounced in the case of pulverulent mixtures.
As a variant, the authors investigated formation of disilicides
by vacuum reduction of the metallic oxides according to the
formula $Me_xO_y + zSi = Me_xSi_{z-y} + ySiO$ and checked the beginning
of the reaction by measuring the pressure which rose as a result
of SiO formation. The results obtained for Ti, V, Nb, and Ta are
listed in table 3. This method requires a more complicated ap-
paratus and is more difficult to employ in industry than the
direct fusion of metal with silicon. Furthermore, it yields less
pure products and is inappropriate for metals with volatile
oxides (Mo, W). The optimum conditions for a direct reaction be-
tween metal and silicon are: $TiSi_2$ 1000 C, 2 hours; $ZrSi_2$ 1000 C,

2 hours; VSi_2 1200 C, 0.5 hours; $NbSi_2$ 1000 C, 0.5 hours;

Card 2/3 $TaSi_2 < 1100$ C < hours; $CrSi_2$, $MoSi_2$ and WSi_2 1000 C, 0.5 hours.

Production of Disilicides of Difficultly Fusible Metals   SOV/78-4-12-16/35

L. M. Khrenova, G. N. Makarenko, and V. P. Dzeganovskiy assisted
in the experiments. There are 4 figures, 3 tables, and 11 ref-
erences, 6 of which are Soviet.

ASSOCIATION: Institut metallokeramiki i spetssplavov Akademii nauk USSR
(Institute of Cermets and Special Alloys of the
Academy of Sciences, UkrSSR)

SUBMITTED: July 2, 1958

Card 3/3

S/180/60/000/02/017/028
E111/E152

AUTHORS: Koval'chenko, M.S., Samsonov, G.V., and Yasinskaya, G.A.
             (Kiyev)

TITLE: Alloys of Transition-Element Borides with Other Metals

ABSTRACT: The high brittleness of transition-metal borides limits
          the application (Ref 3) of some of their useful
          properties (Refs 1, 2).   The authors suggest that it is
          therefore important to study their pseudo-binary alloys
          with ductile metals. Creep tests at 1000 °C (Ref 4)
          showed that few metals were suitable for high-temperature
          use.   Ternary boride phases, which might be
          advantageous (Ref 5), have not been studied much
          (Refs 6-8).   In the present work the reaction of borides
          with metals in the pseudo-binary systems was:
          ZrB_2-Mo, TiB_2-Mo, CrB_2-Mo, TiB_2-Cr and ZrB_2-Cr.

          Alloys were prepared by sintering the mixed powders.
          Approximate determination of liquidus lines was made
          visually (Ref 10), alloy melting points also being
          determined (Ref 11) to fix its position more precisely

Card
1/2

S/180/60/000/02/017/028
B111/B152

Alloys of Transition-Element Borides with Other Metals

In addition micro- and macro-hardness determinations of phases were made together with metallographic and X-ray examinations. The hypotectic diagrams for the above systems are given in Figs 1, 2, 3, 4 and 5 respectively. Tay Shou-bey of the Institut Metallov AN KNR (Institute of Metals Academy of Sciences CPR), G.N. Makarenko and V.I. Kostikov participated in the experimental work. There are 5 figures and 12 references, of which 8 are Soviet and 4 English.

Card
2/2

SAMSONOV, G.V.; KOVAL'CHENKO, M.S.

Regularities in the sintering of high-melting compound powders.
Porosh. met. 1 no.1:21-29 Ja-F '61.   (MIRA 15:5)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR.
                          (Sintering)
                        (Ceramic metals)

S/137/61/000/012/060/149
A006/A101

AUTHORS: Koval'chenko, M.S., Samsonov, G.V.

TITLE: Application of the theory of viscous flow to powder sintering by
             hot pressing

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 45, abstract
             120318 ("Poroshk. metallurgiya," 1961, no. 2, 3 - 13, English
             summary)

TEXT: The authors employ Ya.I. Frenkel's method to describe the sinter-
ing process and take into account changes in the viscosity with decreasing poro-
sity. A relationship is obtained for changes in porosity during hot pressing.
This relationship is qualitatively confirmed by experimental results of hot
pressing of glass and W and Cr carbides. In the latter case changes in viscosity
as a result of grain growth were taken into account. The viscosity factors of
these carbides at high temperatures were estimated. There are 21 references.

                                                     R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 1/1

KOVAL'CHENKO, M.S.; SAMSONOV, G.V.

Applying the viscous flow theory to powder sintering with hot pressure.
Porosh. met. no.2:5-13 Mr-Ap '61.   (MIRA 15:5)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR.
         (SINTERING)   (VISCOSITY)

S/137/62/000/004/036/201
A006/A101

AUTHORS: Koval'chenko, M. S., Paderno, V. N.

TITLE: A Conference on metal science and production technology of cermet
              sintered carbides, refractory metals and compounds on their base,
              in Moscow, June 5 - 9, 1961

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 38, abstract 4d243
              ("Poroshk. metallurgiya", 1961, no. 5, 115 - 116)

TEXT: Information is given on a Conference on sintered carbides, organized
by the All-Union Scientific Research Institute of Sintered Carbides in Moscow,
from June 5 - 9, 1961. The Conference heard 30 reports on investigations of the
structure and properties of sintered carbides of various grades; on the effect
of the composition upon the physical and mechanical properties; on the develop-
ment of new methods for manufacturing refractory compounds and the study of their
properties.

                                                      R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 1/1

21360
S/021/61/000/011/008/011
D299/D304

15.2240

AUTHORS: Koval'chenko, M. S., and Samsonov, H. V., Corres-
           ponding Member AS UkrRSR

TITLE: NbC-C section of the diagram of Nb-C system

PERIODICAL: Akademiya nauk UkrRSR. Dopovidi, no. 11, 1961,
            1478-1480

TEXT: The specimens were prepared of a mixture of NbC (with 11.1%
Nb) and pure anthracene black, by hot-pressing at temperatures of
2950-2980°C. The carbon content in the alloys varied between 2
and 95%. The alloys with higher carbon content had a very porous
structure. The specimens underwent a metallographic investigation.
The eutectic melting point of the system NbC-C was found to lie
between 2950-3000°C. A table lists the measured values of the melt-
ing point as well as the corrected values (for losses by radiation
etc.). On this basis, a tentative diagram of the NbC-C section is
constructed. It is noted that the melting point of NbC which was
found to be at 3500°C, agrees well with the results of other in-

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NbC-C section of ...

21360
S/021/61/000/011/008/011
D299/D304

vestigators. The section NbC-C is of eutectic type, which agrees with the results of M. Nadler, C. Kempter (Ref. 4: J. Phys. Chem., 64, 10, 1471, 1960); the eutectic melting point is, however, by approximately 200°C lower than that found in Ref. 4 (Op. cit.). A certain solubility of carbon in NbC was established on the basis of experiments with the specimens of low carbon content. The NbC-C eutectic, with melting point between 2950-3000°C is considerably lower than the TaC-C eutectic; it also corresponds to a considerably higher carbon content than does the eutectic of the TaC-C system. There are 2 figures, 1 table and 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: E. Storms, N. Krikorian, J. Phys. Chem., 64, 10, 1472, 1960; M. Nadler, C. Kempter, J. Phys. Chem., 64, 10, 1472, 1960.

ASSOCIATION: Instytut metalokeramiky i spetsial'nykh splaviv AN USSR (Institute of Powder Metallurgy and Special Alloys AS UkrRSR)

SUBMITTED: May 24, 1961

Card 2/2

15 2610   25925   S/126/61/012/001/017/020
                                            E193/E480

AUTHORS: Koval'chenko, M.S. and Samsonov, G.V.

TITLE: Relaxation processes during hot pressing of
             molybdenum carbide

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.1,
             pp.145-148

TEXT: The density of sintered powder compacts, prepared by the
hot pressing method, depends, in addition to other factors, on the
manner in which the pressure is taken off the pressed component.
If the load is taken off the compact at the sintering temperature,
the size of the compact gradually increases (i.e. its density
decreases) after the removal of the load.   The object of the
present investigation was to study this after-effect ("relaxation
elasticity") on hot-pressed Mo_2C.   A Mo_2C powder, prepared by
direct reaction between molybdenum and carbon and characterized by
a particle size of 0.5 to 40 µ, was used in the hot pressing
experiments carried out at 2000 to 2300°C on a manually-operated
lever-actuated press.   The powder, placed in a graphite die of
8 mm diameter, was sintered for 2 to 5 minutes at a given
temperature under a pressure of 115 kg/cm^2, after which the load
Card 1/4

Relaxation processes during hot ...

S/126/61/012/001/017/020
E193/E480

was taken off and the compact was held at the temperature for a
further 0 to 20 minutes. The compact was then rapidly cooled and
its density determined by the hydrostatic weighing method. The
results are reproduced in Fig.1, where the density (g/cm^3) of
sintered compacts is plotted against the sintering time (minutes)
at temperatures ($°C$) indicated by each curve, the broken parts of
these curves relating to sintering under pressure. It will be seen
that upon the removal of pressure from the compact its density
decreased with time to approach an equilibrium or quasi-equilibrium
value ρ_0 whose magnitude depends on the temperature and the
density attained at the moment of removal of the pressure. Since
the rate of decrease of ρ should be proportional to the
relative difference $\Delta\rho/\rho_c$ between the attained and the
equilibrium values, it can be shown that

$$\frac{\Delta\rho}{\rho_0} = const. e^{-\frac{t}{\tau}} \qquad (2)$$

where t is the sintering time after the removal of pressure and
Card 2/4

25925

S/126/61/012/001/017/020

Relaxation processes during hot ...   E193/E480 .

τ is the relaxation time.   Hence, the time-dependence of $\ln(\Delta\rho/\rho_o)$ should be linear, and this was confirmed by the results of the present investigation.   It was shown also that

$$\tau = \tau_o e^{\frac{U}{RT}} \qquad\qquad (4)$$

where   T is the absolute temperature and   U is the activation energy for the process studied.   Since it was found that, in the case under consideration   U = 75200 cal/mol   and τ_o = 6.99 sec, Eq.(4) becomes

$$\tau = 6.99 \ e^{\frac{38850}{T}}$$

This means that an increase in the sintering temperature and the resultant increase in the plasticity of the sintered material brings about a decrease in the relaxation time.   There are 3 figures and 4 Soviet references.

Card 3/4

25924   S/126/61/012/001/017/020
Relaxation processes during hot ...   E193/E480

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov
               AN UkrSSR (Institute of Powder Metallurgy and Special
               Alloys AS UkrSSR)

SUBMITTED: October 3, 1960

Card 4/4   Fig.1.
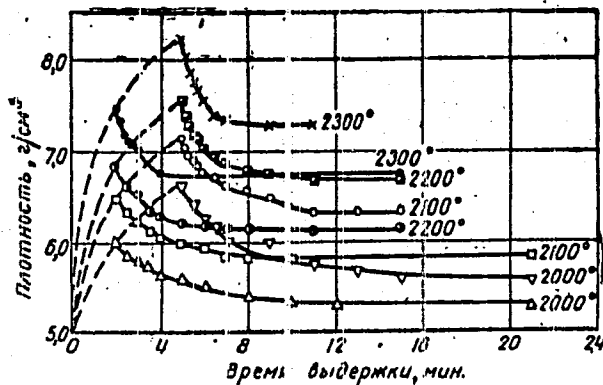
S/081/62/000/003/048/090
B156/B101

I. 1600

AUTHORS: Samsonov, G. V., Koval'chenko, M. S.

TITLE: Certain rules for the sintering of high-melting compound
              powders

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1962, 371-372,
              abstract 3K187. (Poroshk. metallurgiya, no. 1, 1961, 20-29)

TEXT: The behavior of the powders of high-melting nonplastic compounds
during compression is investigated. It is shown that the compacting
process is governed by the same laws as are effective with metal powders,
the elasticity effect being greater, while there are breaks in the pressure
dependence associated with the great brittleness and lack of plasticity of
these metal-like compounds. Investigation of the sintering of compacts
of high-melting compounds has shown that the density developed after hold-
ing isothermally is practically constant, the explanation lying in cessation
of the process of creep. Sintering of high-melting compound powders with
hot pressing has been investigated, the first stage of rapid shrinkage
being accompanied by compacting due to deformation of particles, and by
Card 1/2

Certain rules for the sintering ...   S/081/62/000/003/048/090
                                        B156/B101

simultaneous recrystallization resulting in the shrinkage process being
retarded. The phenomenon of expansion when the external pressure is
removed during hot pressing is investigated, and the relaxation time for
this process, a time which decreases by exponential law as the temperature
rises, is determined. [Abstracter's note: Complete translation.]

Card 2/2

33802
S/137/62/000/001/054/237
A060/A101

AUTHORS: Samsonov, G. V., Koval'chenko, M. S.

TITLE: Certain laws of the sintering of high-melting alloy powders

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 38, abstract 1G288
               ("Poroshk. metallurgiya", 1961, no. 1, 20 - 29 [English summary])

TEXT: The process of pressing powders of TiB_2, CrB_2, $(TiCr)B_2$ is well de-
scribed by equations of the type $\log P = -a \log \beta + b$, where P is the specific
pressure, β is the relative volume, a and b are constants. Sintering under pres-
sure does not affect the variation of the density of these powders, which is con-
nected with their brittleness. A study was also made of the elastic reaction af-
ter the pressing. Intensive shrinkage at the sintering of briquets from these
powders is observed at $0.75 - 0.8 \, T_{abs.dens}$. The kinetics of the hot pressing of
W carbide at 2,100 - 2,500°C under pressures up to 165 kg/mm^2 was studied. The
experimental data were processed by means of the McKenzie and Schellvort equa-
tion adapted to hot pressing, taking into account the variations in the coeffi-
cient of viscosity as a function of grain growth. After relieving the pressure

Card 1/2

33802
S/137/62/000/001/054/237
Certain laws of the sintering of...   A060/A101

in the course of hot pressing a drop in the density of the specimens was observed,
and it is explained by relaxation phenomena. The relaxation times and the acti-
vation energy of this process for W carbide are estimated.

R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 2/2

AUTHORS: Koval'chenko, M. S., Samsonov, G. V.

TITLE: Investigation of alloys of zirconium boride with molybdenum

TEXT: The external appearance of specimens after sintering was studied by metallographic and X-ray analysis and shrinkage curves were taken for alloys of ZrB_2 with Mo containing 0.5-99.5 mol.% of ZrB_2. In the average range of concentration, at $> 1800^\circ C$, increase in size is observed, indicating the formation of intermediate compounds. At a ZrB_2 concentration $> 5\%$, the phase $MoZrB_2$ forms. At $ZrB_2 \sim 92\%$ there is a eutectic with melting point $\sim 2650^\circ C$. The solubility limit of ZrB_2 in Mo is ~ 4 mol.%.

[Abstracter's note: Complete translation.]

Card 1/1

42025
S/659/62/008/000/017/028
I048/I248

| 16?0

AUTHORS: Koval'chenko, M.S., and Samsonov, G.V.

TITLE: Viscous flow during the sintering of powders by the
hot-compacting method.

SOURCE: Akademiya nauk SSSR. Institut metallurgii, Issledovaniya
po zharoprochnym splavam. v.8. 1962. 116-126

TEXT: This is a discussion of the nature of processes causing the
densification of various powdered materials during hot compacting,
and the relationship of these processes to the viscous flow in
crystalline substance; the sintering taking place during the hot
compacting is considered to be a viscous flow phenomenon caused by
the combined actions of external pressure and surface tension. A
number of equations are derived, the most important being:

$$F(f) = Pt/4\eta \qquad (12)$$

for Newtonia bodies as glass, resins, etc., and

$$F(f) = \frac{P}{\eta_0 b} \ln (1+bt) \qquad (17)$$

Card 1/3

Viscous flow during the sintering...

for crystalline powders; the terms used are:

$$F(f) = \frac{5}{3}\ln(3-f) - \frac{1}{3}\ln f_0 + \frac{5}{3}\ln(3-f_0) + \frac{1}{3}\ln f_0 \quad \left[\text{equation } 10\right],$$

P is the external pressure, t is the time, η is the laminar viscosity coefficient of the sintered material, η_0 is the viscosity at $t=0$, b is calculated from $b=(l^2-l_0^2)/l^2 t$, f is the porosity of the sintered material and f_0 is f at $t=0$, l is the av. grain size of the material at the time t, and l_0 is the initial grain size. Equation [12] agrees with the experimental data of J. Williams Symposium on powder metallurgy, 1954. Iron and Steel Inst., London 1956 . To determine the validity of equation 17 . WC powder (particle size 10 microns) was sintered at 2100-2500°C under pressures of 70-165 kg./sq.cm.; the F(f) - ln (1+bt) relationship was linear, and the variations U (the energy of "loosening" of the crystalline lattice) with temperature were small indicating that the deformation pro-

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S/659/62/008/000/017/028
I048/I248

Viscous flow during the sintering...

processes are governed by a diffusion mechanism. The viscosity of Cr_3C_2, calculated from the data of Hamjian and Lidman   J. Metals, 5, 1953 is 1.93×10^{11}, 7.52×10^{10}, and 1.46×10^{10} g./cm.sec. at 1370, 1480, and 1590°C respectively; the data of the above authors agrees with the relationships revealed in this work. These relationships are valid only for non-reversible changes in the density; reversible changes occur during the hot sintering of certain porous poly-crystalline substances such as Mo_2C, and the variations in density in this case are described by:

$$\Delta \rho / \rho_0 = const. x e^{-t/\tau}$$

where $\Delta \rho / \rho_0$ is the relative reversible change in density, ρ_0 is the equilibrium density after relaxation, and τ is the time of relaxation calculated from $\tau = \tau_c e^{U/RT}$, τ_c being 6.99 sec. and U being ·75000 cal./mole for Mo_2C within the temperature range 2000-2300°C. There are 6 figures and 3 tables.

Card 3/3

S/770/62/000/000/001/003

/P. 1152

AUTHOR: Koval'chenko, M.S.

TITLE: Application of zirconium and its compounds in the making of hard and refractory alloys.

SOURCE: Primeneniye tsirkoniya i yego soyedineniy v promyshlennosti; (materialy soveshchaniya pri Gosplane, GNTK i Akademii nauk USSR, Kiyev, 1960g.) Kiyev, Izd-vo AN UkrSSR, 1962, 14-23.

TEXT: The paper comprises a literature survey of the characteristics and applications of Zr compounds with C, B, N, and Si for hard, high-m.p., products with elevated high-temperature (HT) strength, high E, chemical inertness to both acids and alkalis, refractoriness in contact with molten metals, and high electric and thermal conductivity. The primary source of basic information is the classic book on hard alloys by R.Kieffer and P.Schwarzkopf (Hartstoffe und Hartmetalle, 1953. Russian translation in Metallurgizdat, 1957) and 21 Soviet papers published through 1959. ZrC is highly acid-resistant and oxidation-resistant (details cited). The Institute of Powder Metallurgy and Special Alloys (IMSS), AS UkrSSR, has in- vestigated the interaction of ZrC crucible material and found: No interaction (IA) with Ta, Mo, W, and Cr up to 1,800-2,000°C. No short-term IA, but significant

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Application of zirconium and its compounds...   S/770/62/000/000/001/003

IA upon long exposure, with molten Al and CaF$_2$ and SiO$_2$ fluxes. Active IA with Si, Ni, and Co (details tabulated). ZrN is insoluble in HNO$_3$, soluble in concentrated H$_2$SO$_4$, but not in weak HCl and H$_2$SO$_4$ solutions (mechanical properties listed). ZrB$_2$ (mechanical properties listed) begins to oxidize on exposure to air at 600-700° C. ZrB$_2$ does not interact with molten Bi, Pb, Sn, and Zn up to 80 hrs, is not wetted and does not interact with molten pig iron and steel, is refractory to Al and Si melts, but interacts actively with Cr, Ni, and Co (tabulated in detail), interacts with Mo (forms a eutectic at about 1,850°C), and is wetted by molten Cu. Refracto-ry to CaF$_2$ fluxes. ZrSi$_2$ can be heated in air without oxidizing. It is inactive to mineral acids (except HF), is alkali-solution resistant, but it soluble in them in the presence of borax. Reacts strongly with Pt in fused borax. Hardness characterist-ics of ZrSi$_2$ are briefly summarized. Parts are made of hard and refractory Zr compounds and alloys by means of powder metallurgy, comprising pressing and sintering at below the m.p. of compound or components. The preparation of tech-nical ZrC by carbon-black carbidization ($ZrO_2 + 3C = ZrC + 2CO$), that of pure ZrB$_2$ by borocarbide reduction of ZrO$_2$ ($2ZrO_2 + B_4C + 3C = 2ZrB_2 + 4CO$), that of pure ZrN by nitriding of metallic Zr powder at 1,200°C, and that of ZrSi$_2$ by pressing Zr and Si powders in stoichiometric ratio and sintering at 1,200° in an Ar or H atmosphere are described in some detail. Methods developed at the IMSS for "hot pressing" (simultaneous pressing and sintering) and by extrusion of mixtures of

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Application of zirconium and its compounds...   S/770/62/000/000/001/003

evaluation of WC-ZrC-Co in comparison with WC-TiC-Co are reported. Currently ZrB with readily available Fe ligature are being developed; the results of this work promises useful applications for cutting tools. The IMSS thermocouple cited above consists of an inner graphite rod and an external ZrB_2 sheath; the calibration curve of such a thermocouple and a ZrB_2/ZrC thermocouple are shown. The straight-line characteristic and resistance to immersion (up to 20 times) in molten metal are noted. ZrB_2 is also used in HT-furnace heater elements which can operate to 2,500°C in reducing and neutral media and in a vacuum and for bulk resistors for operation at up to 600°. There are 4 figures, 3 tables, and 24 references (21 Russian-language Soviet and the 2 German-language publications by R.Kieffer and the 1 English-language paper by F.Glaser cited in the text of the abstract).

ASSOCIATION: Institut metallokeramiki i spetssplavov AN USSR (Institute of
          Powder Metallurgy and Special Alloys, AS UkrSSR).

KOVAL'CHENKO, M.S.; NESHPOR, V.S.

Session of the Department of Technical Sciences of the Academy
of Sciences of the Ukrainian S.S.R. on problems involving the
effect of nuclear radiations on the properties of materials. Atom.
energ. 13 no.4:388-390 O '62.   (MIRA 15:9)
          (Materials, Effect of radiation on--Congresses)

SAMSONOV, Grigoriy Valentinovich; KOVAL'CHENKO, Mikhail Savvich;
    CHUMACHENKO, T.I., red.;-MATUSEVICH, S.M., tekhr. red.

    [Hot pressing] Goriachee pressovanie. Kiev, Gos.izd-vo tekhn.
    lit-ry USSR, 1962. 211 p.   (MIRA 15:7)
                            (Powder metallurgy)

DISHINEVICH, Ya.S. [Dyshyievich, IE.S.]; KOVAL'CHENKO, M.S.

General meeting of the Department of Technology of the Academy of Sciences of the Ukrainian S.S.R. Prykl.mekh. 9 no.5:577-578 '63.
(MIRA 16:10)

KOVAL'CHENKO, M. S.
TITLE: Seminar on refractory metals,compounds, and alloys (Kiev, April 1963).
SOURCE: Atomnaya energiya, v. 15, no. 3, 1963, 266-267

ACCESSION NR: AP3008085

M. S. Koval'chenko. Behavior of some refractory materials exposed to neutron irradiation.

The electron structures of vanadium refractory compounds, iron borides, carbides, nitrides, silicides, and scandium and its oxide, and refractory compounds were described by Ye. A. Zhurakovskiy and others; those of titanium and its alloys, by S. A. Nemnonov, and K. M. Kolobova; those of low titanium-oxides and La, Pr, Nb, Sm oxides and fluorides, by E. Ye. Vaynshteyn and others; those of hard refractory chromium compounds, by A. Z. Men'shikov, S. A. Nemnonov, and G. V. Samsonov; and those of borides of rare-earth elements, by E. Ye. Vaynshteyn and Yu. B. Paderno. Measurements of metallic\and covalent bonds in the niobium-nitrogen system was discussed in a report by M. I. Korsunskiy and Ya. I. Genkina.

ASSOCIATION: none

SUBMITTED: 00   DATE ACQ: 070ct63   ENCL: 00

SUB CODE: ML   NO REF SOV: 000   OTHER: 000

Card 11/11

L 32670-66   EWT(m)/EWP(e)/T/EWP(t)/ETI   IJP(c)   ES/JD/WW/JG/GG/GD/WH

ACC NR: AT6013574   SOURCE CODE: UR/0000/65/000/000/0456/0464

AUTHOR: Koval'chenko, M. S.; Samsonov, G. V.

ORG: Institute of Material Science Problems, AN UkrSSR (Institut problem materialove-deniya AN UkrSSR)

TITLE: Investigation of the behavior of nonmetallic materials used in atomic reactors, subjected to neutron irradiation

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorga-nicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 456-464

TOPIC TAGS: neutron irradiation, boride, carbide, solid mechanical property NUCLEAR REACTOR MATERIAL, HIGH TEMPERATURE CERMET MATERIAL, HARDNESS

ABSTRACT: The literature on the effect of neutron irradiation on structure and mecha-nical properties of TiB_2, TiB_2-Ti cermet, FeB_1Fe_2B, GaB_6, $Cr-Al_2O_3$ cermet, SiC, Ti_2C, Mo_2C, UC, UC_2 and Mo_2C_1 is reviewed. The behavior of these high temperature materials under 10^{16}-10^{21} neutrons/cm^2 density and 0°-1000°C range indicates their usefulness for various applications in nuclear reactors. Under neutron irradiation of boron-con-taining materials the following cleavage reaction occurs

$$_5B^{10} + _0n^1 = _3Li^7 + _2He^4$$

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L 32670-66

ACC NR: AT6013574

It was found that the stability of borides declines with increasing covalent character of the bondings within boride crystals. The neutron irradiation of high temperature materials results in their increased hardness. The increase in microhardness $\Delta H = H - H_0$ (where H_0 is microhardness of nonirradiated material) due to irradiation with 10^{16} and 10^{18} neutrons/cm^3 is 31.8% and 37.5% respectively for titanium carbide, 46.5% and 50.0% respectively for molybdenum carbide, and 56.8% and 63.3% for GaB_6. Orig. art. has: 6 figures, 3 formulas.

SUB CODE: 11,07/   SUBM DATE: 03Jul65/   ORIG REF: 017/   OTH REF: 021

Card 2/2 P L G

L 068(5-67   EWT(m)/EWP(k)/EWF(e)/EWP(w)/EWP(t)/ETI   IJP(c)   JD/JG/GG

ACC NR: AP6034018   (A)   SOURCE CODE: UR/0226/66/000/010/0048/0064

26

B.

AUTHOR: Koval'chenko, M. S.; Ogorodnikov, V. V.

ORG: Institute of Problems in Material Science AN UkrSSR (Institut problem
materialovedeniya AN UkrSSR)

TITLE: Effect of neutron irradiation on the properties of titanium and chromium
carbides

SOURCE: Poroshkovaya metallurgiya, no. 10, 1966, 48-64

TOPIC TAGS: titanium carbide, chromium carbide, carbide neutron irradiation,
neutron irradiation effect, carbide property, carbide structure

ABSTRACT: Specimens of titanium and chromium carbides, prepared from TiC and Cr_7C_3
powders by hot compacting (porosity not over 15%), were subjected to neutron
irradiation in the isotopic channel of a VVR-M type nuclear reactor. It was found
that neutron irradiation affected the size of specimens. The length of chromium-
carbide specimens decreased by 0.5% after a dose of 10^{18} neutrons/cm^2, and increased
by 0.5% after a dose of 10^{20} neutrons/cm^2. There was no significant change in the
length of titanium-carbide specimens after a dose of 10^{16} neutrons/cm^2, but they
expanded by about 0.5% when the dose was increased to 10^{20} neutrons/cm^2. The
lattice parameters also were affected by the irradiation. The parameter a of chromium
carbide increased by 0.124% and the cell volume increased by 0.24% after a dose of

Card 1/2

L 06845-67

ACC NR: AP6034018   O

10^{18} neutrons/cm^2. A dose of 10^{20} neutrons/cm^2 increased parameter a by 0.147%,
parameter c by 0.221%, and the volume of the cell by 0.52%. The microstructure of
the carbides was also affected by irradiation. Before irradiation, the average
grain size of titanium carbide was 15—16 μ. Irradiation with 10^{16} neutrons/cm^2
reduced it by 29% to 11 μ, and irradiation with 10^{20} neutrons/cm^2 reduced it by 48%
The microhardness of chromium carbide irradiated with 10^{18} neutrons/cm^2 increased
by 23%, and with 10^{20} neutrons/cm^2, by 34%. The microhardness of titanium carbide
increased by 26% after irradiation with 10^{20} neutrons/cm^2. Irradiation also increased
the microbrittleness approximately equally in both carbides. The resistivity of
chromium carbide increased by 35 and 60% after respective doses of 10^{18} and
10^{20} neutrons/cm^2, and that of titanium carbide increased by 14 and 23% after
respective doses of 10^{16} and $1C^{20}$ neutrons/cm^2. It was concluded that neutron
irradiation of carbides increases the resistivity, microhardness and brittleness,
and decreases the average grain size. In general, titanium carbide was found to
be more irradiation resistant than chromium carbide. The effects of irradiation can
be eliminated by annealing at 1200C for 1 hour. Orig. art. has: 9 figures and 1 table.

SUB CODE: 11, 20/ SUBM DATE: 18Feb66/ ORIG REF: 005/ OTH REF: 004/
ATD PRESS: 5101

Card   2/2   LS

ACC NR: AP6034104   SOURCE CODE: UR/0089/66/021/004/0302/0304

AUTHOR: Koval'chenko, M. S.; Ogorodnikov, V. V.

ORG: none

TITLE: Effect of neutron radiation on the electric resistivity of titanium and chromium carbides

SOURCE: Atomnaya energiya, v. 21, no. 4, 1966, 302-304

TOPIC TAGS: titanium carbide, chromium carbide, neutron radiation, carbide, neutron irradiation, carbide electric resistance, irradiation effect, titanium compound, electric conduction

ABSTRACT: Cylindrical specimens (8 mm in diameter, 10—15 mm long) of hot-compacted TiC and Cr_7O_3 carbides with a porosity of 5--15% were irradiated at 100C with an integral flux of 10^{16}—10^{20} neut/cm^2 (TiC) and 10^{18}—10^{20} neut/cm^2 (Cr_7O_3); the number of fast neutrons in the flux was lower by about one order. The irradiated specimens were annealed in an argon atmosphere at 400—1200C for 1 hr, and the electric resistivity of the specimens was measured at these temperatures and also at room temperature. Irradiation with a flux of 10^{18} and 10^{20} neut/cm^2 increased the electric resistivity of Cr_7O_3 from 110 to 148 and 175 μohm·cm, respectively. Irradiation with a flux of 10^{16} and 10^{20} neut/cm^2 increased the electric resistivity of TiC from 52 to 60 and 64 μohm·cm. Annealing at 600 and 800C brought about no noticeable change in the electric conductivity. The electric conductivity relaxation in Cr_7O_3

Card 1/2   UDC: 621.039.553

ACC NR: AP6034104

carbide irradiated with a flux of 10^{18} and 10^{20} neut/cm^2 starts at 1000 and 600C, respectively, and at 1000C in TiC carbide. However, no complete relaxation of the electric resistivity occurred even at the relativity high annealing temperatures used. Isochronous annealing showed that radiation defects in TiC are more thermally stable than those in Cr_7O_3 because the melting temperature of TiC (3147C) is higher than that of Cr_7O_3 (1660C). It can be assumed that the irradiation-induced point defects, particularly the vacancies, in TiC and Cr_7O_3 are quite stable. The intersite atoms are partially annealed during irradiation as a result of recombination of weakly dissociated Frenkel pairs and absorption in traps. Healing of vacancies in metals occurs at a temperature of about 0.3 of the melting temperature (K). In the investigated carbides, the healing of defects occurs at temepratures somewhat higher than 0.4 of the melting temperature (K). Orig. art. has: 2 figures and 1 table.

SUB CODE:11,20/ SUBM DATE: 12Jun66/ ORIG REF: 005/ OTH REF: 010

Card 2/2

ACC NR: AP6034194   SOURCE CODE: UR/0369/66/002/005/0532/0537

AUTHOR: Ogorodnikov, V. V.; Koval'chenko, M. S.; Krayniy, A. G.; Kutsenok, T. G.;
Karasev, V. S.; Slavuta, V. I.; Konozenko, I. D.; Ryzhkov, Yu. T.

ORG: Institute of the Science of Materials (Institut problem materialovedeniya);
Physics Institute AN UkrSSR, Kiev (Institut fiziki AN UkrSSR)

TITLE: Radiation effect in titanium and chromium carbides

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 5, 1966, 532-537

TOPIC TAGS: refractory carbide, titanium carbide, chromium carbide, nuclear reactor
material, irradiation effect, radiation damage, titanium compound, carbide, neutron
flux, nuclear reactor, grain size, metal physical property / 66 P-M nuclear reactor

ABSTRACT: Changes in electrophysical properties of titanium carbode TiC and
chromium carbide Cr_7C_3 have been studied after irradiation of these materials with a
fast neutron flux at ~100C in the 8BP-M nuclear reactor of the Academy of Sciences
UkrSSR. Also, thermal recovery of irradiated refractory titanium and chromium
carbides was studied to obtain data on defects in the solid state. The study was
initiated for the purpose of assessing the applicability of these carbide materials
in nuclear reactors. Radiation resistance to a flux of fast neutrons in the 10^{16} to
10^{20} n/cm^2 dose range was, in general, higher in cubic TiC than in hexagonal Cr_7C_3,
as reflected in the differently increased lattice parameters, macroscopic dimensions,
microhardness, and electric resistivity. Only microbrittleness increased equally
in irradiated TiC and Cr_7C_3. The average grain size of both carbides decreased

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ACC NR: AP6034194

simultaneously. Recovery of the properties studied and of the average grain size was observed in both irradiated carbides after heat treatment at a temperature in the 400—1200C range. The recovery of properties with the exception of microbrittleness of both carbides occurred in several stages. Thermally activated glide of dislocations was seen as the primary cause of the recovery in the low-temperature (about 400C) stage, while diffusion which leads to coagulation of point defects and formation of precipitates was the predominant factor of the strengthening of materials at increasing temperature of heat treatment. Orig. art. has: 4 figures.

SUB CODE: 11, 18/ SUBM DATE: 04Apr66/ ORIG REF: 004/ OTH REF: 003/

Card   2/2

ACC NR: AP7002164   (N)   SOURCE CODE: UR/0089/66/021/006/0470/0476

AUTHOR: Koval'chenko, M. S.; Ogorodnikov, V. V.; Krayniy, A. G.

ORG: none

TITLE: Effect of neutron irradiation on the structure and properties of lanthanum hexaboride

SOURCE: Atomnaya energiya, v. 21, no. 6, 1966, 470-476

TOPIC TAGS: lanthanum hexaboride, lanthanum hexaboride neutron, irradiation, lanthanum hexaboride structure, lanthanum hexaboride property, neutron irradiation lanthanum hexaboride

ABSTRACT:
  Lanthanum hexaboride specimens, cylinders 8 mm in diameter and 10 mm long
  hot compacted from the LaB$_6$ powder (31.3% boron, 0.1% carbon and 0.5% oxygen),
  were irradiated with 10^{18} and 10^{20} neutr/cm^2 integral doses of thermal
  neutrons in the VVR-M-type nuclear reactor. The irradiation temperature did
  not exceed 100C. The amount of burned B^{10} isotope was found to be 0.1% at an
  irradiation dose of 10^{18} neutr/cm^2, and 17% at an irradiation dose of
  10^{20} neutr/cm^2, which corresponds to a reduction of total boron content
  in the LaB$_6$ surface layer of 0.02 and 2.9%, respectively. The specimens
  irradiated with 10^{20} neutr/cm^2 broke down into particles from one to several
  microns in size. An irradiation dose of 10^{18} neutr/cm^2 was not large enough
Card   1/2   UDC: 621.038.553:546.654

KOVAL'CHIK, I.M. (g.l'vov)

Some transformations of multiple Wiener integrals [with summary
in English]. Ukr.mat.zhur. 12 no.1:25-31 '60.   (MIRA 13:10)
            (Integrals) (Transformations(Mathematics))

KOVAL'CH'IK, I.M.

/b· /o

AUTHOR: Koval'chyk, I.M.

TITLE: On representing the solution of Cauchy's problem for a certain integral in a Banach space in the form of a continual integral

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 10, 1961, 1254 - 1258

TEXT: Following the general results of Yu.L. Dalets'kyy (Ref. 1: DAN URSR, 134, 1013, 1960) the author considers the solution of Cauchy's problem

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} - A(x, t)u = 0, \quad u(x, 0) = \varphi(x) \qquad (2)$$

in a Banach space $\mathcal{E}$, where $u(x, t) \in \mathcal{E}$, $\varphi(x) \in \mathcal{E}$, $A(x, t)$ is a bounded linear operator acting in $\mathcal{E}$, and the problem is considered for the half-space Q: $-\infty < x < +\infty$, $0 < t < +\infty$. The space C of a function

Card 1/3

On representing the solution of ...

λ which is continuous for $0 \leqslant t \leqslant 1$ and satisfies $\lambda(0) = 0$ is considered. $U(\lambda)$ is the operator which maps C into $\mathcal{E}$. The segment $[0.1]$ is divided into n parts by the points $0 = t_0 < t_1 < \ldots < t_n = 0$, and $U(\lambda_1, \ldots, \lambda_n) = U\hat{\lambda}_n$ where $\hat{\lambda}_n$ is the portion with vertices $(t_i, \lambda(t_i))$, $i = 1, \ldots, n$. The following theorems are proved: Theorem 1: If $U(\lambda)$ is bounded and continuous and $\max\limits_{0 \leqslant t \leqslant 1} /\lambda(t) - \hat{\lambda}_n(t)/ \to 0$ is $n \to 0$ implies that $//U(\lambda) - U(\hat{\lambda}_n)// \to 0$ in a known norm in $\mathcal{E}$, then the integral $\int\limits_C U(\lambda)d w\lambda$ exists, where the integral is defined by

$$\int\limits_\mathcal{E} U(\lambda)d_W\lambda = \lim_{n \to \infty} \frac{1}{V} \frac{1}{\pi^n t_1 (t_1 - t_1) \ldots (t_n - t_{n-1})} \int\limits_{-\infty}^{+\infty} \overset{(n)}{\cdots} \int U(\lambda_1, \ldots, \lambda_n) \times$$

$$\times \exp\left[-\frac{\lambda_1^2}{t_1} - \sum_{i=1}^{n-1} \frac{(\lambda_{i+1} - \lambda_i)^2}{t_{i+1} - t_i} \right] d\lambda_1 \ldots d\lambda_n \tag{1}$$

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25328
S/020/61/138/006/004/019
C111/C222

AUTHOR: Koval'chik, I.M.

TITLE: Representation of the solution of the Cauchy problem for a
           parabolic system by a Wiener integral

PERIODICAL: Akademiya nauk SSSR. Doklady, v.138, no.6, 1961, 1284-1286

TEXT: The author uses definitions and notations of an own earlier
paper (Ref.1: Ukr.matem.zhurn., 12, no.1, 25 (1960)). The Wiener
integral of a matrix is the matrix of the Wiener integrals of the
elements of the first matrix.
The author considers the Cauchy problem

$$\frac{\partial u(x,t)}{\partial t} = \frac{\partial^2 u(x,t)}{\partial x^2} + p(x,t)u(x,t),\tag{1}$$

$$u(x,0) = \varphi(x),\tag{2}$$

where

$$u(x,t) = \begin{pmatrix} u_1(x,t) \\ \vdots \\ u_n(x,t) \end{pmatrix}, \quad \varphi(x) = \begin{pmatrix} \varphi_1(x) \\ \vdots \\ \varphi_n(x) \end{pmatrix},$$

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25328

Representation of the solution...

S/020/61/138/006/004/019
C111/C222

$$p(x,t) = \begin{pmatrix} p_1(x,t), \ldots, p_{1n}(x,t) \\ \cdots \cdots \cdots \cdots \\ p_{n1}(x,t), \ldots, p_{nn}(x,t) \end{pmatrix}$$

Theorem: Let $p_{ij}(x,t)$ $(i,j=1,\ldots,n)$ be continuous and bounded in $-\infty < x < +\infty$, $0 < t < +\infty$; $\varphi_i(x)$ $(i=1,\ldots,n)$ be continuous and bounded for all real x. Then the solution of (1)-(2) is representable by the Wiener integral

$$u(x,t) = \int_C \exp\left\{ t \int_0^1 p\left[2\sqrt{t}\, y(\tau)+x,\ t(1-\tau)\right] d\tau \right\} \varphi\left[2\sqrt{t}\, y(1)+x\right] d_W y, \qquad (3)$$

where the symbol exp denotes the matriciant.
For the proof the problem (1)-(2) is replaced by the integral equation

$$u(x,t) = \frac{1}{2\sqrt{\pi t}} \int_{-\infty}^{+\infty} \exp\left[-\frac{(x-\xi)^2}{4t}\right] \varphi(\xi)\, d\xi +$$

$$+ \frac{1}{\sqrt{\pi}} \int_0^t \frac{1}{\sqrt{t-t_1}} \left\{ \int_{-\infty}^{+\infty} \exp\left[-\frac{(x-\xi_1)^2}{4(t-t_1)}\right] p(\xi_1,t_1)\, u(\xi_1,t_1)\, d\xi_1 \right\} dt_1. \qquad (4)$$

Card 2/3

KOVAL'CHIK, I.M.

Wiener integrals. Usp.mat.nauk 18 no.1:97-134 Ja-F '63.

(MIRA 16:2)

(Integrals, Generalized)

KCVAL'CHIK, I.M. [Koval'chyk, I.M.]

A theorem for Wiener's integrals. Dop. AN URSR no.12:1543-1546 '61. (MIRA 16:11)

1. L'vovskiy politekhnicheskiy institut. Predstavleno akademikom AN UkrSSR Yu.A. Mitropol'skim [Mytropol'skyi,IU.O.]

KOVAL'CHIK, I.M. [Koval'chyk, I.M.]

Some theorems on Wiener integrals in a space of continuous
functions of several variables. Dop. AN URSR no.11:1426-
1430 '64.   (MIRA 18:1)

1. L'vovskiy politekhnicheskiy institut. Predstavleno
akademikom AN UkrSSR Yu.A. Mitropol'skim [Mytropol's'kyi,
IU.O.].

L 32074-65   EWT(d)   P   IJP(c)   S/0021/64/000/011/1426/1430

ACCESSION NR: AP5000607

AUTHOR: Koval'chyk, I. M. (Koval'chik, I.M.)

TITLE: Some theorems concerning the Wiener integral in the space of continuous functions of several variables

SOURCE: AN UkrSSR. Dopovidi, no. 11, 1964, 1426-1430

TOPIC TAGS: Wiener integral, continuous function, multivariable function

ABSTRACT: The Wiener-like integration over the space of continuous functions of two variables was first introduced by J. Yeh (Trans. Amer. Math. Soc., 95, 433, 1960). The Wiener measure in the space C of such functions is given by

$$\mu(S) = \cdots \times \int \cdots \int_{S} \exp\left[-\sum_{i=1}^{m}\sum_{j=1}^{n}\frac{(\cdots)}{(\cdots)}\right] dx_{11}\cdots dx_{mn} \qquad (1)$$

Card 1/2

L 32074-65
ACCESSION NR: AP5000907

when $x_0 = x_{n+1} = 0$. In this article, the author extends some results of the theory of ordinary Wiener integrals to the case of integrals over the space C_2. All results are also valid for a number of variables larger than two. Orig. art. has: 13 formulas.

ASSOCIATION: L'vivs'ky politekhnichny instytut (Lvov polytechnic institute)

SUBMITTED: 27Sep63   ENCL: 00   SUB CODE: MA

NO REF SOV: 004   OTHER: 002

Card   2/2

KOVAL'CHIK, I.M. [Koval'chyk, I.M.]

Effective calculation of a class of Wiener integrals. Dop. AN URSR
no.3:265-268 '65.   (MIRA 18:3)

1. L'vovskiy politekhnicheskiy institut.

KOVAL'CHIK T. L.

USSR / Physical Chemistry. Crystals.,   B-5

Abs Jour   : Ref Zhur - Khimiya, No 8, 1957, 25949

Author   : T.L. Koval'chik, Yu.P. Maslakovets.
Title   : Influence of Impurities on Electrical Properties of Lead
              Telluride.

Orig Pub   : Zh. tekhn. fiziki, 1956, 26, No 11, 2417 - 2431

Abstract   : It was revealed that for a great increase of the con-
              centration of free electrons in PbTe it was necessary to
              introduce two impurities in it - a basic donor impurity
              (Cl, Br, I, Bi, Sb, Nb) and Pb, which is not a donor im-
              purity by itself. The possible causes of this effect
              were considered.

Card   : 1/1

ABSTRACT: An attempt was made to find the quantitative dependence of the crystal
growth rate on the temperature, temperature gradient, and thickness of the liquid
layer for zone crystallization from a solution of the system $PbTe_3$-Te_1-$PbTe_8$. To th
end, a thin layer of tellurium was placed between two single crystals or polycrystal
of lead telluride. Under the influence of the temperature gradient applied to such
"sandwich," the liquid zone with the tellurium moved in the direction of the higher
temperature. In order to measure the rate of zone crystallization of lead telluride,
the displacement of the tellurium zone during the process was determined. The linea
rate of growth of PbTe is expressed by the equation $v = 1.1 \times 10^{-3}$ GD cm/sec, where
is the temperature gradient and D the diffusion coefficient. The values of D for Pb
in Te solution were calculated, and the activation energy in the 550-770 °C range was
determined. Orig. art. has: 4 figures.
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